



Thesis Preparation Guide

University of Győr
Computer Science MSc Program

2022

1 Introduction

The goal of this guideline is to define the formal requirements for the thesis, submitted to the Department of Mathematics and Computational Sciences at the end of the Computer Scientist MSc program.

The guideline should be applied together with the university's Education and Exam Regulations (EER), and the rules defined in both documents must be kept. The EER is available at neptun.sze.hu/en_GB/information-for-students. Thesis related rules are given in the *Thesis* section. Note that the English EER can be slightly outdated compared to the Hungarian version. If there is a discrepancy, then the Hungarian EER should be followed.

The guideline provides only the formal requirements and does not contain:

- final examination related rules – these are defined in *The Final Examination* section of EER.
- questions related to thesis project assignment and deadlines – these are published by the department in each semester.
- general rules related to the Computer Scientist MSc program – these can be read at https://math.sze.hu/en_GB/computer-science-msc.

2 Formal Requirements

The thesis document should use standard A4 page size. The thesis can be submitted in

- electronic version (the thesis document as PDF, the mandatory annexes as separate PDFs, the source code as ZIP), or

- in electronic and printed version.

If the thesis document is printed, then it should be printed to A4 sized sheets. One copy is enough. The content of the electronic and the printed version should be identical. The printed version is returned to the student at the final examination.

2.1 Structure

The thesis document should contain the following elements in the given order:

- title page,
- task description page (signed by the internal supervisor, external supervisor and the head of the department),
- declaration of independent work (signed by the student),
- abstract,
- table of contents,
- content of the thesis,
- bibliography,
- appendix (optional).

If the task description requires the preparation of source code (this is typical in the Computer Scientist MSc program), then the source code should be submitted with the thesis as a ZIP file. The mandatory annexes are as follows:

- thesis consultation form (signed by the internal supervisor and external supervisor),
- only in case of an encrypted thesis:
 - initiating encryption of diploma thesis (signed by representative of the company),
 - approval (signed by the head of department),
 - acknowledgement (signed by the student),
 - confidentiality declaration (signed by the internal supervisor)

2.2 Length

The length of the thesis should be 30-60 pages, without the appendix. The main text should use an easily readable serif type font, such as Times New Roman or Computer Modern. The font size should be 12 pt. The margin sizes should be 25 mm. The line spacing should be 1.0 (single).

2.3 Figures

All figures should have a number and a caption. Figures should be aligned to the center so that the number and the caption are placed below the figure. A figure cannot be larger than one page. Figure 1 shows an example figure that fulfills the above rules.

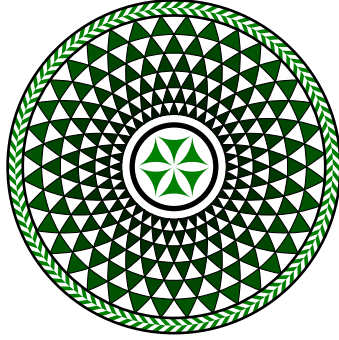


Figure 1: A decorative element from a mosaic in the living room of Casa degli Armorini Dorati, Pompeii. The figure was created using PGF macros.

2.4 Tables

All tables should have a caption. Tables have to be numbered if they are referenced in the document. Tables should be aligned to the center so that the number and the caption are placed above the table. It is recommended to arrange tables so that they fit into a single page. If a table spreads across multiple pages, then the header should be displayed on each page. An example table that fulfills the above requirements is Table 1.

Table 1: The cross validation accuracy of logistic regression (LR) and gradient boosting (GB) on the FooBar data set, using different hyperparameter settings.

Algorithm	Parameters	Accuracy
LR	$C = 1$	96.4 %
LR	$C = 5$	96.7 %
GB	$\eta = 0.1$	97.1 %
GB	$\eta = 1.2$	97.3 %

2.5 Equations

Mathematical formulae have to be numbered if they are referenced in the text. The number should be put into parentheses and it should be aligned to the right. An example for a numbered formula is Equation 1.

$$\text{CE}(w) = - \sum_{i=1}^n (y_i \ln(\hat{y}_i) + (1 - y_i) \ln(1 - \hat{y}_i)) \quad (1)$$

2.6 Citations and Bibliography

The thesis must contain a bibliography which lists all the external sources used in preparing the thesis. All bibliography entries should be cited in the text. The citation style should be numerical and it should use squared brackets. The bibliography entries have to contain all information that makes the given source uniquely identifiable.

The type of a bibliography entry can be among others: book, journal article, conference paper, web site, or other document (such as a thesis). Mandatory fields for books are:

author(s), title, publisher, year. An example for a book entry is [1]. Mandatory fields for journal articles are: author(s), title, journal name, volume, year, start page, end page. An example journal entry is [2].

Mandatory fields for conference papers are: author(s), title, conference name, year, location, start page, end page. An example for a conference paper entry is [3]. Mandatory fields for a web site are the description and web address. If other relevant attributes like author, blog name and publication year are available, then they should be included too. An example web site entry is [4].

References

- [1] T. Hastie, R. Tibshirani, and J. Friedman, *The Elements of Statistical Learning*, Data Mining, Inference and Prediction, Springer New York, 2013.
- [2] J. Friedman, Greedy Function Approximation: A Gradient Boosting Machine, *Annals of Statistics*, Vol. 29 (2000), 1189–1232.
- [3] R. Salakhutdinov, A. Mnih, and G. Hinton, Restricted Boltzmann Machines for Collaborative Filtering, *24th International Conference on Machine Learning*, Corvallis, OR, 2007, 791–798.
- [4] K. Erdem, t-SNE Clearly Explained, Towards Data Science, 2020, <https://towardsdatascience.com/t-sne-clearly-explained-d84c537f53a>.